

CLAIMS

1. A process for the preparation of gamma-cyhalothrin comprising steps of a)
chlorinating 1R *cis*-Z 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl
cyclopropanecarboxylic acid to give 1R *cis*-Z 3-(2-chloro-3,3,3-trifluoro-1-
propenyl)-2,2-dimethyl cyclopropanecarboxylic acid chloride and b)
esterifying 1R *cis*-Z 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl
cyclopropanecarboxylic acid chloride with the (S)-cyanohydrin of 3-phenoxy
benzaldehyde (III).
2. A process according to claim 1 in which the HCl formed during the
esterification is removed from the reaction mass using a combination of
physical methods and a sub-stoichiometric amount of a base.
3. A process according to claim 2 in which the base is added once the
esterification reaction has been taken to greater than 50% completion using
only physical removal of the HCl.
4. A process according to claim 2 or claim 3 in which the base is an organic base
selected from pyridine, alkylpyridines, quinoline, the trimethylether of
triethanolamine or the mono-hydrochloride salt of DABCO, or an inorganic
base selected from an alkali metal carbonate or bicarbonate or alkaline earth
metal oxide, hydroxide or carbonate or a combination of an organic and an
inorganic base.
5. A process according to claim 4 in which the base is a pyridine or an
alkylpyridine.
6. A process according to any one of claims 2 to 5 in which the esterification
reaction is carried out in a solvent selected from toluene, o-xylene, mixed

xylenes or halobenzenes, for example fluorobenzene, hexane, cyclohexane, iso-hexane, heptane, octane or petroleum ethers.

- 5 7. A process according to claim 6 in which the solvent is hexane, cyclohexane, iso-hexane, heptane or octane.
8. A process according to any one of claims 2 to 5 in which the esterification reaction is carried out in a two-phase system in which one phase is an aqueous phase, optionally containing an organic base.